Syllabus, PHYS 102 (Electricity and Magnetism), Spring 2021

Instructors

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Given the enrollment numbers for PHYS 102, this course is being given online only. If you have any questions or comments about the course, the grading, the problems, or the physics, we would like to hear from you. Please feel free to send an email at any time – we will try to respond as quickly as possible. Please see the Canvas page for PHYS 102 to see our Zoom Office Hours. Also, you can email any of us to prearrange a private discussion by Zoom – we will make a best effort to accommodate such requests.

Learning Objectives

This course serves as an introduction to electricity and magnetism. You will learn about the nature of charge in matter and about the physical interactions between charges as described by Maxwell's Equations. Applications to basic circuit elements in both DC and AC circuits will also be addressed.

Announcements

Announcements are made on the Physics 102 Canvas page under the "Announcements" tab. Registering for PHYS102 automatically registers you for the PHYS102 site on Canvas.

General Format of the Class

This class will be a mixture of asynchronous (pre-recorded) lecture material and live discussion meetings (given via Zoom). The pre-recorded lecture videos will be available through the course Canvas page. In addition, there will be "Plenary course meetings (PHYS 102)" and "Small group discussions (PHYS 104)".

Plenary course meetings (PHYS 102) will be held Monday and Wednesday at 8:30 AM and 9:45 AM online in Zoom. In these sections' concepts will be explained and further illustrated through sample problems. While you must be enrolled in either PHYS 102 Section 001 at 8:30 AM or PHYS 102 Section 002 at 9:45 AM, you may attend either. A recording will be made for those who cannot attend either section in real time.

Small group discussions (PHYS 104) will be held either Thursday, or Friday according to your assigned section. In these small group discussions, you will work with classmates (via Zoom rooms) to solve problems posed during class. This will provide an opportunity to reinforce concepts introduced in the course and learn problem- solving strategies. To get credit for PHYS 102, you must register for PHYS 104 and choose a section that fits your schedule. Some recordings of these sessions will be available for students who cannot attend in real time but you are strongly encouraged to attend your section in real time if it is possible.

To reiterate, you must be signed up for both PHYS 102 and PHYS 104. *(Note: PHYS 104-905 taught by Dr. Dunning will be a pre-recorded video, posted to the PHYS 102 Canvas page, and accessible to all PHYS 102 students. Those students enrolled in PHYS 104-905 should feel free to attend another Phys 104 section of their choosing, should they wish to participate in a real-time discussion section.)*

Laboratory

For our online laboratory exercises, students will use the Pivot Interactives platform from Vernier. Using pre-recorded, high-quality videos of real experiments, students make measurements and analyze data within the Pivot Interactives online environment. In these experiments, students can vary experimental parameters one at a time to view the results from a set of many recordings of the same experiment. In one lab, students will upload their own videos for analysis. For the Online Laboratory, students must purchase access to Pivot Interactive which costs $10. To purchase access to Pivot Interactives and access to the laboratory exercises, students will need to follow the instruction at:
https://help.pivotinteractives.com/en/articles/3389724-student-instructions

To get access to the online laboratory exercises for this course, students will also need the Class Key:
b9efec33

All questions related to the laboratories should be directed to Dr. Yu.

Textbook/Webassign

We are using the textbook **Physics for Scientists and Engineers**, 10th Edition, by Serway and Jewett (ISBN-13: 978-1337553278). Along with the textbook, you will need a WebAssign subscription in order to access and complete the homework for the course.

Note: Students who took Phys 101 in the Fall 2020 and purchased the Cengage Unlimited single term access should be able to register for the Phys 102 WebAssign page without any additional purchase. Please let us know if there are any issues with this.

To simplify the process of getting the textbook and WebAssign access we recommend purchasing a 1-term (4 months) Cengage Unlimited subscription at https://www.cengage.com/unlimited/ . This will get you full access to the WebAssign homework materials for the course, as well as access to an electronic version of the textbook. However, each student should select the option that best suits their needs. We will discuss the various purchase options on the first day of class, so feel free to wait until then to make your purchase. Students should also note that a single active Cengage Unlimited account should cover other Cengage-based materials (WebAssign, MindTap, etc.) required for additional courses taken concurrently with Physics 102. For a small additional cost you can also rent a physical copy of the textbook for one semester.

To access the WebAssign course material for the first time, go to http://www.webassign.net/, click on **Enter Class Key** at the top, and enter: **rice 8800 0398**. When you create the account, please make sure you ***register with your name as it appears on your Rice ID***. Also, please enter your Student ID number. This registration process will give you free access until Feb. 8th (14 days from start of the course).

If you opt to obtain a hard copy of the text, you may wish to purchase/borrow an older edition of the book, *e.g.*, the hardbound 9th edition (ISBN-13: 978-1133947271) or the loose-leaf 9th edition (ISBN-13: 978-1305080362). (We used the loose-leaf hybrid edition for the past few years... so you likely know someone who has a copy for borrowing/purchase.) Note that the chapter layout of the 9th edition differs somewhat from the 10th edition.

WebAssign Registration

When registering with WebAssign use the Class Key: **rice 8800 0398**. Please fill in your Student ID when registering with WebAssign. This will help ensure you get proper credit for your work.

OpenStax

You are encouraged to use the free *University Physics* textbook available through OpenStax as a supplemental text for the course. The book is available in both e-text and PDF formats at the link below. (You can download a pdf using the link if you like.) You should check on updates from time to time.

e-text: https://openstax.org/details/books/university-physics-volume-2

Calculators and Symbolic Programs

You should have a hand-held calculator for use in doing calculations in homework sets, pledged problems, quizzes, and exams. It does not need to be programmable, but it should compute trigonometric and exponential functions. You may not use symbolic manipulation programs, calculators or websites to complete your homework, quizzes, pledge problems, or exams.

WebAssign Homework

You will be assigned weekly homework problems in the WebAssign online homework system. These will provide experience in problem solving and in using the concepts discussed in the course. They are selected to help you prepare for the pledged problems, and exams. You are encouraged to discuss these suggested problems with fellow students, tutorial leaders, and instructors. You may attempt to answer each question up to 5 times in WebAssign for full credit. Note that students will get individualized versions of the problems (i.e. the numbers in your version of the problem may be different to your classmates) so you will need to work out the final answers for yourself.

Pledged Problems

Pledged homework problems will be distributed weekly online via WebAssign. These are intended to give you some experience in working, completely on your own, problems that are typical of those that will appear on exams. **You may consult your own notes, problem solutions we have posted, your own textbook (including the eBook version), and a calculator; all other resources are banned. You may not work with other students.** The pledge problems will consist of multiple choice and numerical or symbolic response questions. They are to be taken in a single sitting and with a 2.5 hour time limit.

Once you have started the assignment, the timer does not stop, even if you close WebAssign. The actual due date for a pledged problem is either the date and time when the timer expires or the original assignment due date and time, whichever comes first. For example, if you start a 10-minute pledged problem set 3 minutes before the due date and time, you will only have 3 minutes to complete it.

Pledge problem scoring: The first attempt for each individual part of each problem is worth 100% of the allotted points, the second attempt for each individual part of each problem is worth 66% of the allotted points, and the third attempt for each individual part of each problem is worth 33% of the allotted points. After three incorrect attempts, no points will be awarded for that part of the problem. For the free-response questions the correct answer will be revealed after three incorrect attempts for a particular part of any problem.

Tests and Final Examination

There will be two 90-minute midterm tests and a three-hour comprehensive final exam in the course. These will be administered via WebAssign and the rules for them are the same as the pledge problems. **You may consult your own notes, problem solutions we have posted, your own textbook (including the eBook version), and a calculator; all other resources are banned.** The tests and exams are timed and once you open the test or exam you will have a predetermined amount of time to complete it. Once you have started the assignment, the timer does not stop, even if you close WebAssign. The actual due date for a test or exam is either the date and time when the timer expires or the original assignment due date and time, whichever comes first. For example, if you start a 90-minute test 30 minutes before the due date and time, you will only have 30 minutes to complete it. Like the pledged problems, the tests and exams will be comprised of a mixture of multiple choice questions and free response questions.

There is no partial credit for the multiple-choice questions. That being said, you may change your submitted answer for the individual questions as needed during the exam period (up to 50 times per MC question). Only your final submitted answer for each MC question will be counted and graded once you have finished your exam. No feedback will be given on MC questions until after the exam due date (i.e., you will not be told if your final submissions are correct/incorrect until after the exam due date).

Free-response questions are graded in the same manner as the free-response questions for the pledged problem sets.

Make-ups and Excused Days

Make-ups for missed quizzes, pledged problems, tests, or laboratories will be given at the discretion of the instructor. You can be excused without penalty or be allowed a delayed make-up of quizzes, pledged problems or tests if one of the following two conditions is met:

1. You are on official university business or you have a conflicting class, and you notify us well beforehand. If you have a conflicting class, a signed note from the instructor of that course is required stating that you actually attended class on the day of the test.

2. You have a serious reason beyond your control, such as your own illness or a death in your family, and you get word to us immediately. As soon as possible, notify your instructor in writing or by e-mail. (The policy on laboratory make-ups is stated in the lab manual available on Canvas).

Grades

Your final PHYS 102 grade will be determined from an average that will be weighted as follows:

Two Tests ---------- 15% each

Final Exam ---------- 20%

Pledged Problems ---------- 15% (one lowest score will be dropped)

WebAssign Homework----- 15%

Laboratory ---------- 20%

Additionally, you must receive a final laboratory grade of 50% or above in order to pass PHYS 102.

You should keep track of your own grades on all tests, pledged problems, homework sets, and the final exam so that you can confirm the accuracy of our records. Students who receive a weighted average of 90% or greater will receive a grade of at least A-, while those obtaining a weighted average of 75% or greater will receive a grade of at least a B-, and those students who obtain averages of 60% or greater will receive a grade of at least C-. We may lower these cut-offs at the end of the semester, but we will not raise them. In PHYS 104 you will receive a grade of Satisfactory or Unsatisfactory.

The Honor System

We believe very strongly in the Rice Honor System: it applies to all work submitted for a grade in the course (except for suggested problems), and we perform our due diligence as instructors in upholding it. A student's compliance with the Honor Pledge is assumed on pledged problems, tests, the final examination, and any other work that has been announced as pledged. A student's submission of answers for an online pledged assignments/test/etc. will be treated as the student's formal statement of compliance with the Honor Pledge.

Numerous resources for solving physics problems are available via the Internet. These sites can be perfectly legitimate tools when seeking additional examples to learn difficult concepts, but none of them are permitted for use on pledged assignments, such as quizzes, pledged problems, and tests. We are aware of many of these sites and maintain user profiles on them that allow us to check for PHYS 102 course content appearing thereon.

Students with Disabilities

Any student with a documented disability seeking academic adjustments or accommodations is requested to speak with the instructors during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities are encouraged to also contact Disability Support Services in the Allen Center (e-mail: adarice@rice.edu, phone: 713-348-5841) during the first two weeks of class so that timely and appropriate arrangements may be made.

Diversity and Inclusion

Historically, people of color, women, and other groups have been underrepresented in physics and astronomy. This lack of diversity has likely led to missed opportunities for exploration and discovery. While the field is now more inclusive, it is important to understand that our history impacts the current state of our field. The questions that we choose to ask in science are influenced by who is included in the scientific endeavor.

We all bring different experiences to this class. As participants in this class, all instructors and students should strive to honor the diversity of the class. In this class, you have a right to define your identity, but no student is ever presumed to speak on behalf of any group or anyone other than themselves. You have the right to be called by your pronouns and the name you wish. If there are aspects of this course that act as barriers to your inclusion in course content, please contact one of the instructors privately.